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Title: Fermi-LAT detection of gamma-ray emission in the vicinity of the star forming regions W43 and Westerlund 2

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Abstract

Particle acceleration in massive star forming regions can proceed via a large variety of possible emission scenarios, including high-energy gamma-ray production in the colliding wind zone of the massive Wolf-Rayet binary (here WR 20a and WR 121a), collective wind scenarios, diffusive shock acceleration at the boundaries of wind-blown bubbles in the stellar cluster, and outbreak phenomena from hot stellar winds into the interstellar medium. In view of the recent Fermi-LAT detection of HESS J1023-575 (in the vicinity of Westerlund 2), we examine another very high energy (VHE) gamma-ray source, HESS J1848-0145 (in the vicinity of W43), possibly associated with a massive star cluster. Considering multi-wavelength data, in particular TeV gamma-rays, we examine the available evidence that the gamma-ray emission coincident with Westerlund 2 and W43 could originate in particles accelerated by the above-mentioned mechanisms in massive star clusters.

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